

REMARKS

Claims 33-42, 44, and 47-99 are all the claims pending in the application.

Referring to page 2 of the Advisory Action dated January 30, 2004, several of the previous rejections (or portions thereof) have been removed by the Request for Reconsideration filed October 27, 2003. The following rejection remains:

1. Claim 33 and the claims which depend therefrom continue to be rejected under 35 U.S.C. § 112, first paragraph, on the basis that the term “in the crystalline phase” is assertedly new matter;

2. Claim 33 and again the claims which depend therefrom also continue to be rejected under 35 U.S.C. § 112, first paragraph, on the basis that the term “photocatalytically-activated self-cleaning coating” is also assertedly new matter;

3. Claim 47 and the claims which depend therefrom continue to be rejected under 35 U.S.C. § 112, first paragraph, on the basis that the term “said coating has a photocatalytically activated self-cleaning reaction rate of 8.1×10^{-3} to $9.1 \times 10^{-3} \text{ cm}^{-1} \text{ min}^{-1}$ ” is assertedly new matter.

In particular, it is indicated on page 3 of the Advisory Action, that Applicant has not rebutted the Examiner’s position with respect to the difference in line speed between Example 1 of the above referenced application and the additional experimental work that is summarized in the Rule 132 Declaration filed June 20, 2003 (hereinafter “the original McCurdy Declaration”). In particular, it is indicated that “the applicant has not utilized the same line speed or the use of a silica coating as that of the original specification and hence, may have produced different results.”

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It is additionally indicated on page 4 of the Advisory Action that “[t]here is no mention of the annealing properties including rate, temperature, atmosphere, heating source nor is there any mention of substrate purity, substrate crystallinity, processing pressure, precursor purity - any or all of which can account for the claimed characteristics.”

Applicant again respectfully traverses the remaining rejection for the following reasons and, in particular, in view of the attached Supplemental Declaration Under 37 C.F.R. § 1.132 by Richard J. McCurdy, Ph.D.

I. The Original McCurdy Declaration Reproduced Exactly Example 1 of the Above-Referenced Application

First, it must be appreciated that, contrary to the assertion in the Advisory Action, two different samples were produced for the original McCurdy Declaration that are in accordance with Example 1 of the above referenced applications. The first sample (Sample 1) was produced according to Example 1 of the above-referenced application and the second sample (Sample 2) was also produced according to the same Example 1 of the above-referenced application. As Dr. McCurdy explains in the attached Second Declaration, by slowing the linespeed to produce a third sample (Sample 3), which is a common technique in the art, the substrate is exposed to the chemical flows for a longer period of time which consequently grows a thicker film. This was done for the third sample in order to produce the same coating as for the first two samples but but with an increased thickness in order to improve the signal-to-noise ratio of the X-ray diffraction measurement that is used to establish crystallinity. See, Supplemental McCurdy Declaration, ¶¶3-5.

II. The Process of Example 1 Produced a Crystalline TiO₂ Coating

Furthermore, as discussed in ¶6 of the attached Supplemental McCurdy Declaration, it will be appreciated from the X-ray diffraction patterns (Attachments A and B, thereto) that there is a broad diffraction peak centered at roughly 25 degrees, the location of the principal peak of anatase titanium oxide. (The standard library power diffraction file for anatase titanium oxide is also shown in the figure (file 21-1272) for reference.) As Dr. McCurdy attests, this is clear evidence that by replicating Example 1 of the above-referenced application, an anatase titanium oxide coating was produced. The X-ray diffraction pattern for the third sample confirmed that the coating applied thereto was anatase titanium dioxide. Not only was the primary peak of the titanium oxide diffraction pattern found (as in the first sample), but also secondary and tertiary peaks further confirmed that the coating was anatase titanium oxide.

The thicker film made by decreasing the linespeed, showed significantly improved signal-to-noise ratio of the spectra, as well as a sharpening of the peaks. The peak width narrowed as a result of the larger crystallites inherent in the thicker sample. Thus, as one of ordinary skill in the art would recognize, the repeating the process of Example 1 of the above referenced application produced anatase titanium oxide films.

III. The Process of Example 1 Produced a Photocatalytic Self-Cleaning, Crystalline TiO₂ Coating

As discussed in ¶ 7 of the attached Supplemental McCurdy Declaration, the photocatalytic activity of the samples prepared for the original McCurdy Declaration was confirmed.

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IV. The Presence of a Silica Layer

Further, the Examiner asserts in the Advisory Action (*see*, page 3) that the samples described in the original McCurdy Declaration did not have a silica coating. This is simply wrong. Dr. McCurdy attests to the fact that silica coated glass substrates were used for the production of all of the samples of the original McCurdy Declaration. *See*, ¶ 8 of the Supplemental McCurdy Declaration.

V. Annealing Temperature, Substrate Purity, Etc. are not Material to the Present Claimed Invention

As discussed in the attached Supplemental McCurdy Declaration, annealing characteristics (especially a secondary separate annealing cycle) can affect photocatalytic activity of some titanium oxide self-cleaning coatings. The films described in both Example 1 of the above-referenced application and the original McCurdy Declaration, however, are high content anatase titanium oxide as deposited and as such do not need a subsequent annealing step. This is evidenced by the fact that the films were cooled down in ambient air under no special conditions after deposition. Accordingly, it is apparent that the criticality of annealing on the self-cleaning function is nonexistent. *See*, ¶ 9 of the Supplemental McCurdy Declaration.

Further, as also discussed in ¶ 9 of the Supplemental McCurdy Declaration, substrate purity is not important as the films are deposited on top of a silica coating that inhibits effects of the substrate. Substrate crystallinity is also not important as the float glass substrate and the silica underlayer are both amorphous. Processing pressure and process purity are equally irrelevant as film growth rate and film properties are insensitive to changes in process pressure in

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the range of interest (near atmospheric pressure) and reagents used in the invention were common reagent grade chemicals with no subsequent purification prior to use.

In summary, Applicant respectfully submits that the present claimed invention complies with the requirements of 35 U.S.C. § 112, first paragraph. Accordingly, withdrawal of the sole remaining rejection is requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.


Respectfully submitted,

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